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# Tools, Stages and Perspective-Taking during the Architectural Design Process: Preliminary Results from a University-building Case-study in Australia

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**Abstract.** This case-study investigated which tools and techniques building planners use during the architectural design process in order to anticipate future building-user experience. Preliminary qualitative analysis of seven semi-structured interviews with key stakeholders involved in the planning of a university building revealed that architects and designers mainly rely on past experience and tacit knowledge, rather than using systematic pre-occupancy-evaluation methods. Based on insights from interdisciplinary research, this article seeks to encourage further discussion of need-analysis for assistive tools in architectural design.

**Keywords:** Architectural Design, Design Research, Perspective Taking, User Experience, Wayfinding

## 1 Introduction

Architects and designers' understanding of architectural form and function evolves from a fundamentally different mind-set than that of building users [1]. Architectural experts may use different evaluative aspects for environmental appraisal [2]. They have to consider multiple aspects in unison (e.g. costs, energy efficiency, accessibility and building capacity), and may not *solely* focus on user experience [3]. Furthermore, building planners need to take into account expectations and needs of various stakeholders (e.g. the client and specialized consultants, such as landscape architects and wayfinding advisors), which requires perspective-taking and clear communication between all involved parties.

This study aimed to understand which tools and techniques architects and designers use during the multiple stages of the architectural design process and how research could potentially further inform and support this process. Furthermore, it

investigated how architects and building planners anticipate future usage of a yet-to-be-constructed building; specifically, to what extent they anticipate and imagine future building users' experience in terms of their behavior, cognition and emotion.

## 2 Methods

The case at hand was a new university-building for the faculty of Architecture, Building and Planning of the University of Melbourne in Australia [3]. In order to investigate the use of techniques and tools during architectural design, seven individual, semi-structured interviews were conducted with the major stakeholders of this project (one architect, four wayfinding consultants, two future building users). Interviews were video- and audio-recorded and transcribed to text for analysis.

Stakeholders were also asked to imagine and immerse themselves in the role of a particular future user (a first-time visitor, a regular building user, and a design critic), each of whom had a certain goal in mind (meeting a friend, picking up a lunch box at the office, and experiencing the building). While studying the floor plans, stakeholders were motivated to "think aloud" about how these fictional user groups would find their way from one location to another, and what they would experience on the (anticipated) way.

## 3 Preliminary Results

### 3.1 Tools and Techniques during the Architectural Design Stages

Through qualitative analysis of the interview transcripts from this case-study, it appeared that the architects mainly used the initial brief from the university, as well as budget and site requirements, in order to design the floor plans. They regularly consulted the client and mainly relied on past experience and tacit knowledge. They did not work with quantitative tools for wayfinding analysis themselves, but brought in specialized wayfinding consultants after the floor plan design had largely been settled. These wayfinding consultants mainly used tools in the first (information gathering) stage, and less in other (design) stages (Figure 1). For example, in order to visualize their arguments during discussions with the other stakeholders, the wayfinding consultants relied on self-initiated pedestrian counts along with space syntax analyses and a survey for future building users. When asked what a 'utopian support tool' could look like, the wayfinding consultants suggested a 3D-representation of the building, which could interactively *"take in some of the factors of school modeling and syntaxing"* and simulate pedestrian flow *"in order to identify bottlenecks or awkward corners."* Such a utopian tool would primarily need to be time-efficient and immediately legible so that *"somebody could pick up their report and in two minutes understand what they're looking at, rather than trying to interpret a whole series of numbers."*

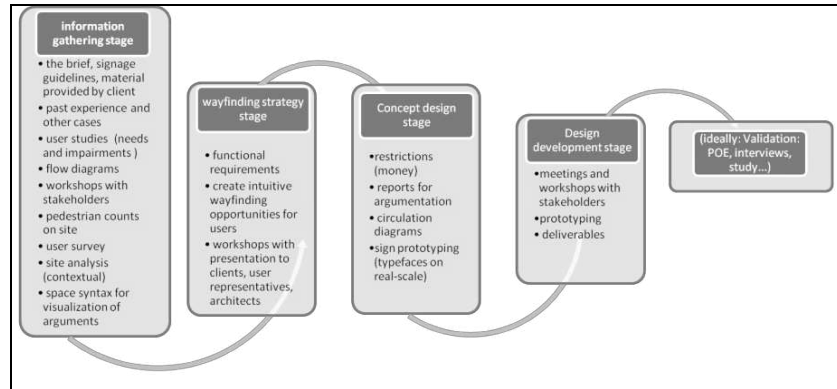


Fig. 1. Stages of wayfinding design from the perspective of the wayfinding consultants.

### 3.2 Anticipation of Future Users' Wayfinding Experience

From qualitative analysis of the imagined wayfinding task, it appeared that each stakeholder mainly anticipated user experience from their own perspective and expertise. Although the task description specifically mentioned different user groups with differing building familiarity and aims, the perspective and the manner in which stakeholders responded remained highly similar for each of the three tasks.

The architect mentioned landmarks outside of the building for orientation first and then continued by commenting on structural building features (such as the high ceiling), “interesting places” (such as an exhibition center), and materials used. When directly asked how a space felt during the imagined user journey, the architect mainly mentioned sculptural elements, expected lines of sight, light conditions, and places for anticipated social interaction between future building users. Often the architect pointed out *all* route opportunities from a given point, rather than *one* route from the perspective of a specific user group.

The wayfinding consultants also mentioned structural features (e.g. the complex façade, prominent staircases, and the large atrium), as well as where they had planned to install signage, and which materials they had used. Occasionally the wayfinding consultants commented on anticipated user strategies, which were mainly based on expected lines of sight from a particular point of view. When directly asked how space felt from the user-perspective, wayfinding consultants tended to describe spatial features (e.g. the high ceiling), light conditions and anticipated user experience in terms of perceived security and openness versus narrowness. They expected a rather sequential interaction with signage that lead *straight*, without distractions, from one location to another. From time to time, the wayfinding consultants took the perspective of a certain user group (e.g. “[I] come out, decide to take the central stair, ‘cause you know, [I am] watching out for my health”).

The two future users (architectural graduate students) frequently stated expectations of where signage and rooms could potentially be located, although the floor plans did not specifically include this information (e.g. *“I would expect from this central point here to be able to see some sort of interactive display, or else a list of rooms”*, or: *“I would probably assume that something like a workshop is going to be on the ground floor because you’ve got to have deliveries and you’ve got to get rid of rubbish”*). They appeared to easily take the perspective of a certain user group (e.g. *“as an academic, this probably wouldn’t be the preferred route”*), although one of the graduate students (who was a trained architect) sometimes switched to an allocentric perspective, especially when fascinated by a certain building feature. When directly asked how the space felt, both students mentioned structural features from the floor plan (e.g. *“this would probably be interesting, because assuming that this is all glass around here, it would probably be extremely well-lit”*).

While the architect consistently used an allocentric, floor-plan-view perspective (e.g. *“you’ll see the large, glazed wall there, so essentially, it’s acting as a marker”*), the wayfinding consultants mostly reported anticipated user experience from an egocentric perspective (e.g. *“I know where I’m going which is on level one, which is above me ‘cause I’m next to this terrace I see as I come in”*), and only used an allocentric perspective when explaining details to the interviewer (e.g. *“as you come into this space, you get a sight line through the glazing wall”*). The two future users stayed in the egocentric perspective (e.g. *“If I come back to the foyer, I’d really be looking for some kind of signage, because otherwise, I’d have no idea where to go”*).

## 4 Conclusions

Taking preliminary, qualitative analysis of the interviews and the imagination tasks together, it appears that the architect and wayfinding designers mainly used tacit knowledge and past experience to inform design. Taking the (anticipated) user-perspective was potentially easier for the wayfinding designers and future users, although their comments tended to include structural elements as well (most likely because the view in the imagination task was allocentric by nature). Based on the results from this case-study, we can conclude that analytic, quantitative evaluation tools were seldom consistently used during the design stages.

In order to motivate and improve pre-occupancy evaluation (before a building is constructed [4]) during the architectural design phase, interactive interfaces could be designed, which could allow uploading (concepts of) building floor plans, along with pedestrian count or simulated multi-agent data. Building planners could then use such a system to systematically vary building features, and present this information to the other stakeholders on-the-fly, using it as a communication device and support for perspective-taking.

With this article we hope to encourage further discussion about how and to what extent insights from interdisciplinary research could inform the architectural design process, and how future research could deepen further need-analysis for assistive tools.

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